



MIT student, police officers testify about Sean Collier death

Tsarnaev trial's second week sees emotional testimony, new footage

By Austin Hess, Sanjana Srivastava, and Drew Bent
STAFF REPORTERS

The trial of Dzhokhar Tsarnaev for the 2013 Boston Marathon bombings and subsequent murder of MIT police officer Sean Collier entered its second week with emotional testimonies and never-before released evidence about Collier's death.

MIT and Cambridge police officers and a PhD student witness testified Wednesday about the April 18, 2013 shooting of Collier. The prosecution also presented distant footage of the murder, which showed two figures approaching Collier's squad car parked between the Stata Center and Koch Institute for Integrative Cancer Research and then fleeing through North Court.

Although Collier had been shot twice in the side of the head, once between the eyes, and three times in his right hand, "there was a slight pulse still beating from his carotid," said MIT Police sergeant Clarence Henniger, who reached him first. Despite medical assistance, Collier was pronounced dead upon arrival at Massachusetts General Hospital.

Collier's death

Wednesday's testimonies on Collier's death began with MIT Police chief John DiFava.

At around 9:30 p.m. on April 18, 2013, DiFava saw Collier while leaving campus. "I chatted with him for a few minutes, I told him to be safe, and I left." That was the last time DiFava saw Collier alive. DiFava stayed in the courtroom

after his testimony and was seen comforting others, while also periodically rubbing his eyes.

In video footage captured that night by a security camera on the roof of the Green Building, Collier drives through North Court along the road bordering Stata, bringing his cruiser to a stop in front of the Koch Institute's Main Street entrance shortly after 10 p.m.

Two figures can be seen walking at 10:23 p.m. from the Ames street corner along the path in front of the Koch Institute to Collier's cruiser at other side. The pair runs up to the cruiser, arriving at 10:24 p.m. A figure leans into the driver's seat for a while, at which point a bicyclist comes up the Stata path and passes them.

It was at this time that the Tsarnaev brothers allegedly shot Collier. Then at 10:25 p.m., the two figures emerge and run away.

At 10:30 p.m., police officers and vehicles begin gathering around the cruiser.

Nate Harman, the bicyclist who passed the cruiser and a PhD candidate at MIT, recalled seeing someone by the vehicle. "I just assumed he was an MIT student: young, normal height, thin; he was wearing a dark sweatshirt and a hat," said Harman.

"I remember thinking he had a big nose, but nothing beyond that really," he recalled. "I just laughed, thought I just startled him, just kept going," not realizing anything was wrong. Although the video shows two figures, Harman testified that he "only saw one person."

When lead prosecutor William

Tsarnaev Trial, Page 17

Christina Tournant, freshman, dies while at home in Florida

Chancellor speaks at gathering held in her memory



By Katherine Nazemi and William Navarre
NEWS EDITORS

Christina E. Tournant '18, who lived in Maseeh Hall, died last Thursday in Florida while on voluntary medical leave. She was the second freshman MIT had lost in a week.

The 2014 valedictorian of Osceola

High School, Tournant was interested in studying biomedical engineering at MIT. Tournant was a sister of the Alpha Phi sorority as well as a diver on the swim team.

"She was that kid that was just happy," Tournant's mother, Tava Wilson, told the *Tampa Bay Times*. "She wanted to do all kinds of fun things."

The newspaper reported that minutes before Tournant was found dead last Thursday night, apparently having jumped off a parking garage at Tampa International Airport, she had sent a text message to her mother: "I love you, mom."

"Sorry," she wrote in a separate note, "I couldn't keep fighting."

Tournant had been suffering from postural orthostatic tachycardia syndrome for the past two years, the *Tampa Bay Times* reported. The syndrome caused her severe pain and circulatory issues. Her condition worsened in December, and in February, she took medical leave from MIT.

Wilson said it was the physical

pain that led to her daughter's "emotional pain."

"She was very stoic and didn't want to let on how horrible she was feeling ... She was really stoic to a fault," Wilson said.

MIT President L. Rafael Reif notified campus of Tournant's death in an email last Friday.

"This is a moment when we need each other, a moment for caring, understanding and kindness," he wrote. "We will come through this tragic period together."

Maseeh Hall residents met with their housemasters, graduate resident tutors, and MIT Mental Health representatives last Friday. A larger community gathering was held in Lobby 7 on Saturday to remember Tournant.

"People across our community are feeling the impact of the recent losses and those that came before," Chancellor Cynthia A. Barnhart PhD '88 said at the gathering. "There is no

Tournant, Page 3



VIVIAN HU—THE TECH

Students gather in Lobby 7 to remember Christina Tournant Saturday afternoon.

IN SHORT

March 23–27 is spring break. Enjoy your week off!

Active Minds will host a panel on medical leave Wednesday March 18 from 5 to 6 p.m. in 4-149. Come hear returning students, S^3, and MIT Medical talk about the process of taking leave from MIT.

The spring Underclassmen Giving Campaign (UGC) will be in Lobby 10 the week of April 6. Donate to support public service projects to be undertaken by students this summer.

Send news information and tips to news@tech.mit.edu.

Bitcoin Expo addresses the future of the currency

MIT holds second annual Expo over two days

By Karia Dibert
STAFF REPORTER

Speakers travelled from all over the country to 26-100 last weekend to discuss the future of bitcoin during MIT's second annual Bitcoin Expo. The event was live-streamed to benefit remote viewers.

After a successful run last year, MIT Bitcoin Club president Jonathan Harvey-Buschel '18 said that for 2015, the club wanted to "take it to the next level." Harvey-Buschel estimates that about 500 people attended this year's expo.

This year, the Bitcoin Expo consisted of over twenty events spread out

over two days, punctuated by meals and "networking breaks." The speaker and panelist lineup included founders and CEOs of bitcoin-related companies, engineers at these companies, various professors, and students.

The event addressed bitcoin from a financial point of view on Saturday and a technical one on Sunday. Many who were interested in one aspect more than the other chose to attend only one of the days.

Saturday's opening keynote was delivered by Charlie Lee MS '00, creator of the bitcoin alternative Litecoin and Engineering Manager at Coin-

Bitcoin Expo, Page 9

Phoebe Wang's cause of death determined

The death of MacGregor resident Phoebe Wang '17 on Sept. 21 has been ruled a suicide, according to an email from Terrel Harris, a spokesman for the Massachusetts chief medical examiner's office. The cause of death was listed as "asphyxia due to displacement of oxygen."

"Phoebe was a very active member of MacGregor house and played flute in the MIT Symphony Orchestra," Reif wrote in a Sept. 23 email to the MIT Community, which did not specify the cause of death.

Wang, who hailed from Chesterbrook, Pennsylvania,

had worked at MIT's Lewis Music Library and conducted research for the MIT Energy Initiative, according to her Facebook profile.

An obituary published by MIT News said that Wang was known for her sense of humor, her curiosity, and her desire to explore.

Members of the MIT community can access MIT student support resources and Mental Health Services at <http://together.mit.edu>, or via phone at 617-253-2916 during the day and at 617-253-4481 during nights and weekends.

—William Navarre

NEW EBOLA TEST

MIT develops new method that could take less than ten minutes for a diagnosis.

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REMEMBERING THOSE WE'VE LOST

The Tech's editorial board addresses the tragedies on campus. **OPINION, p. 4**

CONVERSATIONS ON MENTAL HEALTH

Notes from faculty and a message from a student. **OPINION, p. 4**



YO-YO MA PAYS A VISIT TO BOSTON

Check out our review of the great cellist's performance at Symphony Hall. **ARTS, p. 9**

A CAPELLA CONTEST

MIT hosts NCCA Northeast Quarterfinal. **ARTS, p. 10**

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WEATHER

Boston inching toward snowfall record

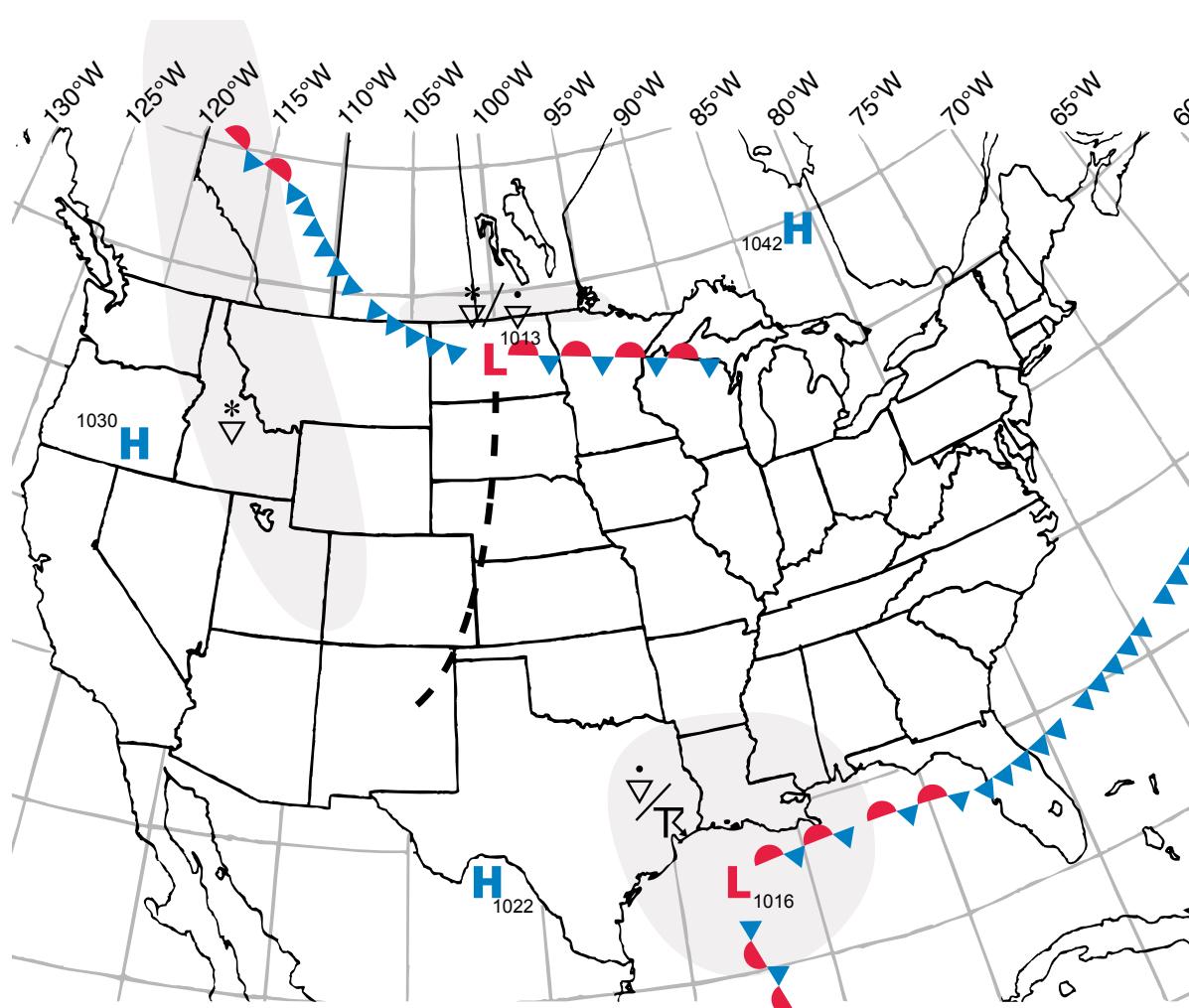
By Vince Agard
STAFF METEOROLOGIST

The onslaught of major snowstorms that struck the Boston area in late January and February has left the city just inches shy of the all-time record for snowiest winter. That record of 105.7 snowfall inches, set in the winter of 1995-1996, will be tied if an additional 1.9 inches of snowfall are recorded at Logan Airport before July 1st. In fact, the record has a chance to be broken this weekend, as a low pressure system will bring moisture from the Gulf of Mexico north to New England in the form of rain and snow. At this time, it appears most likely that the storm will begin as a mostly-rain event on Friday night or Saturday morning before a possible changeover to snow showers on Saturday night or Sunday. Although above-freezing temperatures may make snow accumulation challenging during this storm, there may be another chance for the record to be broken as snow showers move through the area on Monday night. That this record is on the verge of being surpassed is especially impressive considering that the seasonal snowfall total stood at only 5.5 inches as of January 23.

In the short term, a significant cooldown is occurring in advance of the weekend storm, with brisk winds ushering in cold air from the northwest. This will cause today's high temperature to be around 20°F (11 K) cooler than yesterday's.

Extended Forecast

Today: Windy and mostly sunny, high 36°F (2°C). Winds NW at 20-30 mph.
Tonight: Breezy and clear, low 20°F (-7°C). Winds NW at 10-15 mph.
Tomorrow: Partly cloudy, high 38°F (3°C). Winds becoming S, at 5-10 mph.
Saturday: Rain and possible snow, highs near 40°F (4°C).
Sunday: Snow and rain showers possible, highs in the mid 30s °F (3°C).



Situation for Noon Eastern Time, Thursday, March 12, 2015

Weather Systems		Weather Fronts		Precipitation Symbols		Other Symbols	
				Snow	Rain		
H	High Pressure	— — — Trough		*	•	≡	Fog
L	Low Pressure	● ● ● Warm Front		▽	▽	R	Thunderstorm
§	Hurricane	▲ ▲ ▲ Cold Front				∞	Haze
		△ △ △ Stationary Front					Compiled by MIT Meteorology Staff and <i>The Tech</i>

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Financial aid budget, exceeding \$100 million, is highest ever

MIT will allocate \$103.4 million to undergraduate financial aid next year, the MIT Corporation announced at a meeting on March 6.

This marks an 8.8 percent increase from the 2014–2015 budget and is the first time that MIT's undergraduate financial aid budget has exceeded \$100 million.

According to MIT, next year's budgeted increase reflects a commitment of \$3.2 million to reduce the "self-help" portion of MIT's financial aid package, which students generally contribute through loans and earnings. The current aid package includes a \$6,000 "self-help" contribution.

A 3.75 percent increase in

undergraduate tuition and fees was also announced by the Corporation. According to an MIT news office release, Dennis Freeman PhD '86, the dean for undergraduate education, said the \$103.4 million financial aid budget will both cover this increase and "lower the net price for all students with financial aid."

Fifty-nine percent of MIT's undergraduate population receives need-based financial aid from the Institute. Thirty-two percent of undergraduates attend MIT tuition-free.

MIT's financial aid budget has increased steadily since 2000, when it amounted to \$30.5 million.

—Jennifer Switzer

President Reif and Chancellor Barnhart express sympathies

Many faculty and staff members choose to lighten class work loads, postpone problem set due dates

Tournant, from Page 1

shame in asking for help and support."

Tournant's death came less than a week after the death of Matthew L. Nehring '18, which Reif announced on March 1.

"Four days ago, we gathered in lobby 10 for a similar reason," Barnhart said. "Coming so close together, [the deaths] are a terrible blow," she said.

Faculty members have also addressed the deaths in lectures and emails.

"These heartbreaking losses are impossible to fathom," Professor George C. Verghese wrote to 6.011 students. "We are unlikely to ever have the answers we might want,

not having walked in their shoes. That doesn't stop our questions, and our wondering what might have made a difference — and what might still make a difference to others in despair.

"But at a time like this it is also important to — and perhaps impossible not to — reflect on life, and on what matters to us, individually and together."

Verghese canceled Wednesday's 6.011 lecture and said students did not have to turn in one of the class's problem sets. He also invited students to visit the Harvard Art Museums with him.

In an email to his 18.06 students, Professor Gilbert Strang wrote: "In class I also had an opportunity to say a few words about the sad

events of last week and the support I feel for all of you from the President down, the faculty wants only good for every one of you. Please let me know any time I can help you."

Other instructors also expressed similar sentiments and decided to lighten their classes' workload this week. 18.06 and other classes pushed back problem set due dates, and some classes, including 6.01 and 6.006, made tests scheduled for this week optional.

Members of the MIT community who feel affected by the deaths can access MIT student support resources and Mental Health Services at <http://together.mit.edu>, or via phone at 617-253-2916 during the day and at 617-253-4481 during nights and weekends.

ELLIPSIS TRIO

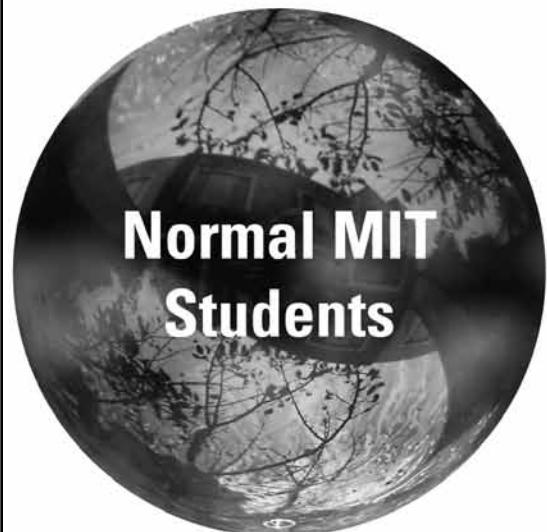
PIANO TRIOS
by Charles Ives, Igor Iwanek, and Arthur Foote

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Killian Hall, MIT 160 Memorial Dr., Cambridge, MA

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The Tech (ISSN 0148-9607) is published on Tuesdays and Fridays during the academic year (except during MIT vacations), Wednesdays during January, and monthly during the summer by *The Tech*, Room W20-483, 84 Massachusetts Avenue, Cambridge, Mass. 02139. Subscriptions are \$50.00 per year (third class). **POSTMASTER:** Please send all address changes to our mailing address: *The Tech*, P.O. Box 397029, Cambridge, Mass. 02139-7029. **TELEPHONE:** Editorial: (617) 253-1541. Business: (617) 258-8324. Facsimile: (617) 258-8226. Advertising, subscription, and typesetting rates available. Entire contents © 2015 *The Tech*. Printed by Upper Valley Press, Inc.

EDITORIAL

A week of tragedy

In the mental health conversation, let us remember those we have lost as individuals

In tragedy's wake, we reel. One student said that "the whole campus is just a raw, stinging nerve right now." Everything seems fragile, so we cling together. We're a little kinder. We hold the door. We say hello to people we don't know too well and wave to people in the hallway even when they're slightly too far away.

We wonder whether we should blame ourselves, whether we have somehow let go of one, two, three, four, five, six, seven. We try to imagine their pain. Did it feel greater than the pain of the loved ones who would be left behind?

In tragedy's wake, we demand answers. We cry out for a solution, sometimes even before we know what the problem is.

We look for patterns, a culprit. We talk, as we should, about medical leave and MIT Mental Health. About

resources and committees and awareness and student trust. We talk about the firehose: psets, deadlines, missed sleep. And we talk about *how* we talk about the psets, the deadlines, the six, four, two, zero hours of sleep.

In tragedy's wake, let us remember.

These conversations, which are unfolding in *The Tech* and elsewhere, are essential. But perhaps too often, we try to fit the stories of those we've lost into a particular narrative. Christina and Matthew were individual people in unique situations. Let us be careful not to assume that these tragic losses resulted from coursework overload, inadequate support services, or a toxic culture.

Instead, in tragedy's wake, let us remember them.

Let us remember Matthew, who brought a passion for robotics to MIT and worked at the Media Lab and *The Tech's* business department. He wanted to study electrical engineering and computer science. Those who knew him say he was quiet, diligent, and kind, and that when he worked in the lounge, his hallmates would join him until every seat was taken. Let us remember Christina, an aspiring biomedical engineer and member of the Alpha Phi sorority. She joined the swim team, and when the pain from her nervous system disorder became too much, she switched to diving. Those who knew her admired her and called her strong, generous, and vibrant.

From all of us here at *The Tech*, we offer our deepest condolences to all the individuals and groups who have been affected by last week's tragedies. May those we have lost rest in peace.

GUEST COLUMN

Transforming MIT culture

Mental health awareness should be part of our daily lives and relationships

By Karen Hao

"Suicide watch might be necessary."

Five words texted to me from my best friend on a school night at 2 a.m. I held my breath, letting the full message sink in. In the past few weeks, he had begun a downward spiral in his mental health after a horrible breakup, and I knew that self-inflicted harm was not a foreign thought to him. The sudden realization that I might lose him incapacitated me.

Thank god this story did not end in death. When I regained my composure, I scrambled to my friend's room and put him on the phone with Mental Health. After several sessions, appropriate medication, and copious amounts of time, he recovered. But not everyone is this lucky.

There were two apparent suicides last week at MIT, adding to four others confirmed in the past 12 months. Last year, there were four confirmed cases at Penn and suspected suicides at Columbia, Princeton, Dartmouth, Yale. All of these people had personalities, friends, and families. Yet all of them have become statistics because suicides at elite institutions are no longer an anomaly. High rates of depression have become the norm.

This is not right. There must be a solution.

My sophomore year, I began my own battle with depression. It crept up so slowly that at first I attributed it to stress over my schoolwork. Then to mood swings from my sleep deprivation. Then it was disappointments over my grades, emotional anxiety from my relationship, strained relations with my parents. I told myself over and over: it's just a phase. But then several months passed. I stopped seeing friends, stopped attending commitments, lost motivation to do anything but sleep. Eventually I ran out of excuses. All the causes I had attributed my depressive moods to had become the effects. I was already several months into my depression when the realization slammed into me full-force: something was seriously wrong.

For me, the scariest part of depression wasn't the isolation or even the thought that it may never end. The most terrifying, crippling sensation was looking at myself in the mirror and not being able to recognize myself anymore. Things that I considered an integral part of my identity — emotional articulation, academic success, resilience — were all gone. Emotions and thoughts that I no longer recognized would seize me unpredictably. I think fundamentally this is what depression stems from. A lack of self-understanding, self-acceptance, and eventually self-worth.

I told no one. I didn't think anyone would

understand. I once overheard someone say about another girl, "I can't get any work done when she's depressed all the time" and vowed then not to be the subject of that sentiment. The thought of finally opening up and having nothing come of it was devastating. Besides, how could someone understand my depression? Something so intimately tied to every little detail of my life, every subtle facet of my personality. Something that I didn't even understand myself.

I was lucky. Even without telling him, my best friend noticed. The same best friend who texted me suicidal thoughts two years later. During my depression, he never tried to understand my battle. He was simply there, a steady comforting presence regardless of my mood. What I learned from him was that I didn't need someone who asked me how I was doing in passing — because it's much easier to say "I'm good" than not — but someone who had been there all along.

This is how I believe we fail at MIT: in the tumultuous schedule of each of our lives, we use the little time we have to celebrate with people during their successes, sometimes cry with them during their failures. But depression is subtle, and when we are too busy to be present for each other's day-to-day, it goes unnoticed until it may be too late.

Hao, Page 5

CORRECTIONS

An article about a recent production of the Boston Ballet, *Lady of the Camellias*, incorrectly attributed the book that the ballet was based on to Alexandre Dumas, who is famous for writing *The Three Musketeers* and *The Count of Monte Cristo*. The book, *La Dame aux Camellias*, was in fact written by Dumas' bastard son, who was also named Alexandre Dumas.

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Dissents are the signed opinions of editorial board members choosing to publish their disagreement with the editorial.

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[1496] Art Project

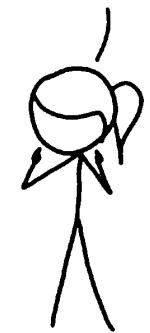
I'M DOING AN ART PROJECT WHERE I TAKE A PICTURE OF MYSELF EVERY HUNDRED YEARS.



IM DOING AN ART PROJECT WHERE I TAKE A PICTURE OF MYSELF EVERY $\frac{1}{24}$ TH OF A SECOND.



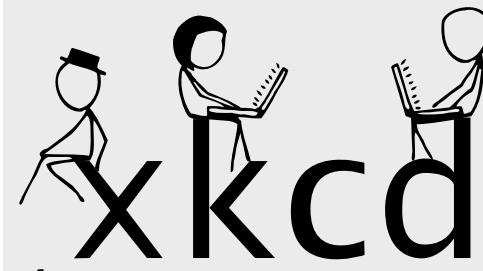
I'M DOING AN ART
PROJECT WHERE YOU
CAN COME TO MY HOUSE
AND WATCH MY ACTUAL
FACE AGE IN REAL TIME.



I'M DOING AN ART PROJECT WHERE YOU ALL DO THOSE THINGS WHILE I EAT A BURRITO.



It's my most ambitious project yet, judging by the amount of guacamole.



**A WEBCOMIC OF ROMANCE,
SARCASM, MATH, AND LANGUAGE**

by Randall Munroe

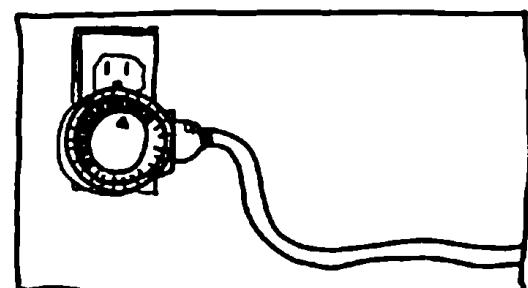
[1495] Hard Reboot

FIGURING OUT WHY MY HOME SERVER KEEPS RUNNING OUT OF SWAP SPACE AND CRASHING:



1-10 HOURS

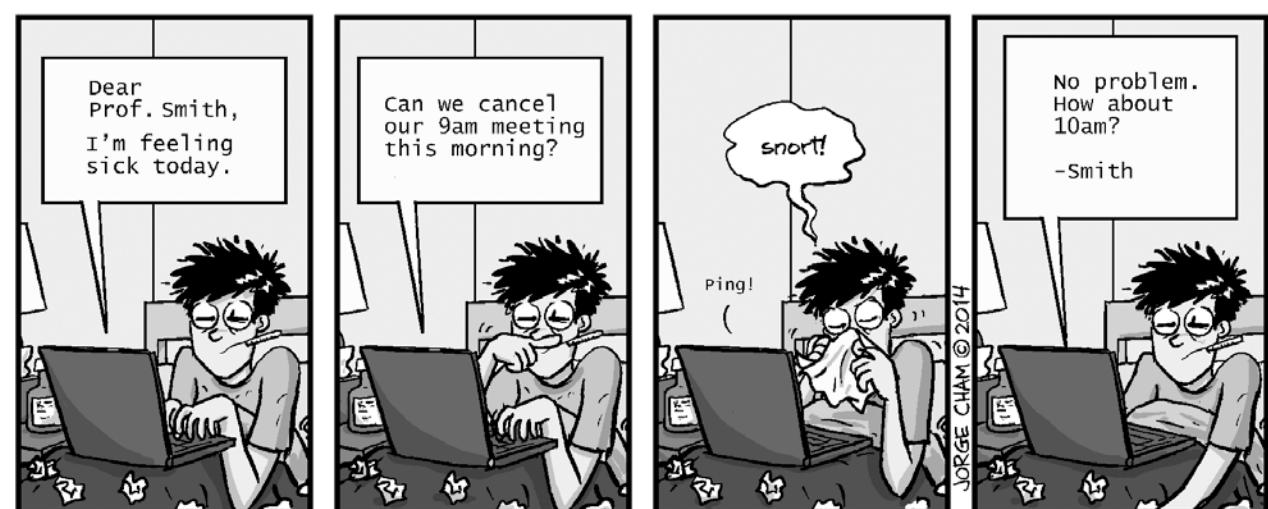
PLUGGING IT INTO A LIGHT TIMER
SO IT REBOOTS EVERY 24 HOURS:



5 MINUTES

WHY EVERYTHING I HAVE IS BROKEN

Google's inevitably reveals that my problem is caused by a known bug triggered by doing things exactly the same way I did them, but until then, I can fix it, or wait a few years until I don't want that combination of things anymore, using the kitchen sink to do it.



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This message brought to you by that manuscript you're supposed to be writing.

Sudoku I

Solution, page 14

A partially filled 9x9 Sudoku grid. The visible numbers are:

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8		3						
7							8	5
5	7	6			9			
			5	6	8			
			4			5	2	6
3	9							8
						4		2
2		7	1			6	9	

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Sudoku II

Solution, page 14

A partially filled 9x9 Sudoku grid. The visible numbers are:

9			4		6			3
	6	1						
5	7		1	8	4			
	4					9		3
		9			6			
1		2					8	
			4	7	2		5	8
						7	2	
	2			5		3		9

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Techdoku I

Solution, page 14

36x			60x		2
	30x			4x	
4		11+		40x	
3÷	3		5x		3x
	20x			6	
40x				18x	

Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

Techdoku II

Solution, page 14

20+				24x
4-	15x			
	6x	300x		1-
2x			24x	
20+				1
	24x			

Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

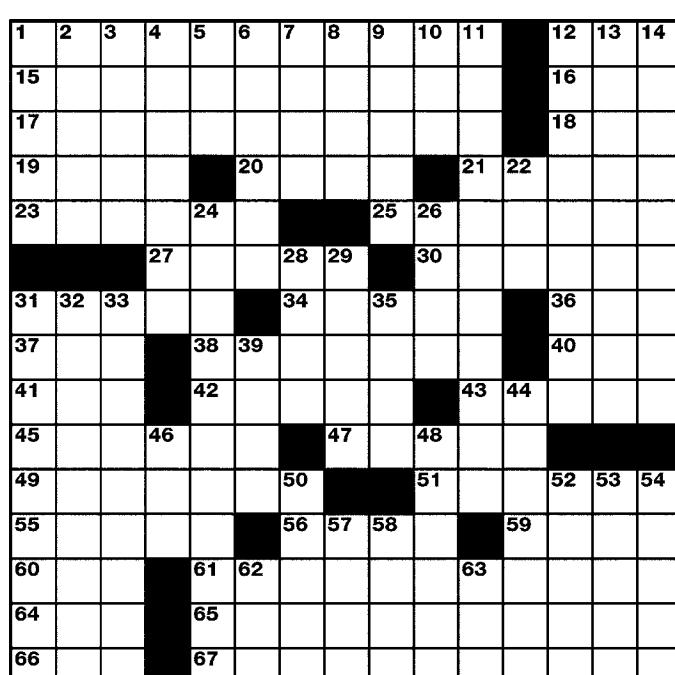
Saturday Stumper

Solution, page 13

ACROSS

ACROSS	
1 Fallen seed, often	40 Kick back
12 Rating for cover applications: Abbr.	41 About 90% of new US homes have them
15 Pan, for instance	42 Playwright who wrote in Danish
16 " __ Town Too" (James Taylor duet)	43 Humble
17 Certain massage recipients	45 She followed Julie and Liza in Broadway's Victor/ Victoria
18 Bother	47 Half a pair for pairs
19 The Apple __ (Tasmania nickname)	49 Source of rolls
20 Grammarian's concern	51 Traditional Basque apparel
21 Where La Bohème premiered	55 Basic wrap
23 High school subject?	56 Horse-opera comebacks
25 Put on again	59 Surname meaning "white"
27 Tray labels	60 Bit of repartee
30 Close	61 Verbal whammy
31 Call aon	64 Key that may close a window
34 Poet encouraged by Longfellow	65 Its coat of arms includes two palms and three lions
36 ". . . __ lack thereof"	66 Utmost
37 1-800-__-LEARN (Department of Education's phone number)	67 Function runner
38 Common dabbler	
DOWN	
1 All wrong	
2 Dissect, in a way	

- 3 Flat from overuse
- 4 Prince Andrew's younger daughter
- 5 Fold opening
- 6 Hook-and-loop product
- 7 Bright flash?
- 8 Double in baccarat
- 9 Life of Pi cover illustration
- 10 Band hanger-on
- 11 '60s "meet your secret admirer" game
- 12 2014's highest-paid female athlete, per Forbes
- 13 Jobs in a digital workplace?
- 14 It has the lead
- 22 A as in Andalusia
- 24 Certain targets, collectively
- 26 One with a big mouth
- 28 Modern bibliography components
- 29 They covered Atlantis
- 31 Beefeaters, e.g.
- 32 Crystal, nine times
- 33 "___ Stole My Lunch Money!" (2011 Weekly World News headline)
- 35 Very thin

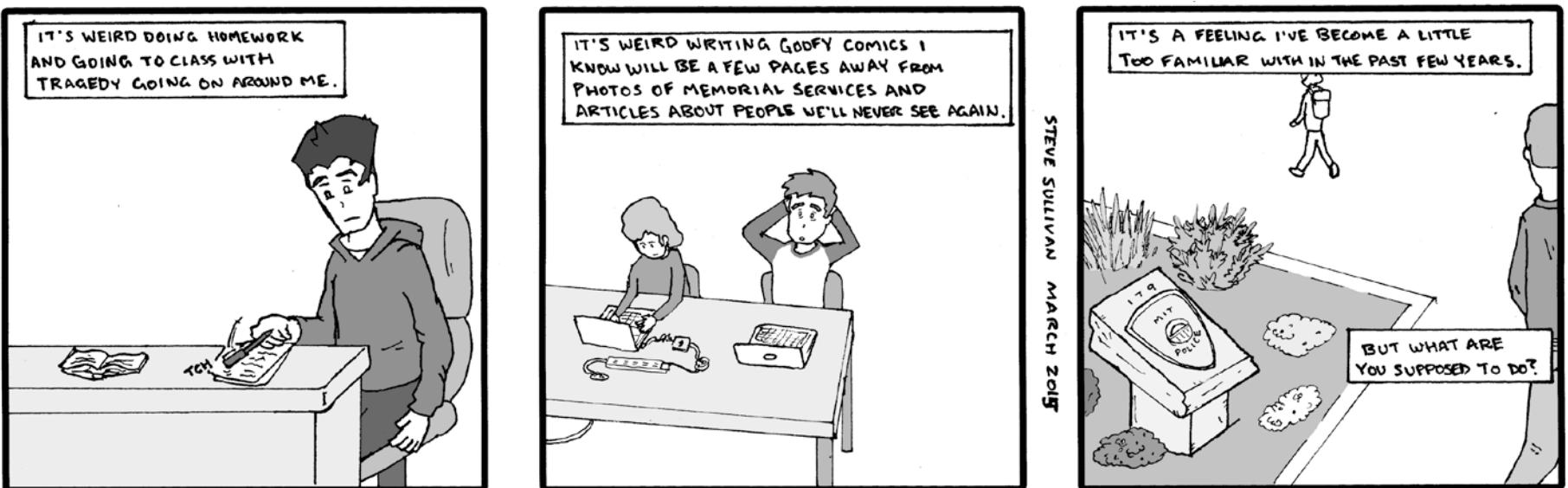


39 Opposite of 1 Down	52 1948 Literature Nobelist
44 Rips into	53 Strip alternative
46 Mother Jones employer: Abbr.	54 More sound
48 Inspiration for American Hustle	57 Underestimates, say
50 Person driven	58 Forward
	62 Don Giovanni pronoun
	63 Copying

UPPERCUT by Steve Sullivan



UPPERCUT by Steve Sullivan



ABOUT-FACE by Billie Truitt

Solution, page 13

ACROSS

ACROSS

- 1 Garbanzo or lima
- 5 Police dept. alerts
- 9 Quarterback's throw
- 13 Intense devotion
- 15 Big family
- 16 Diva's solo
- 17 Took the car
- 18 Big brass horn
- 19 Half a quart
- 20 Renege
- 23 Before, in poetry
- 24 Pig's sound
- 25 Golf-score standard
- 26 Netflix delivery
- 27 Racetrack informant
- 31 Loosen, as laces
- 34 Foal's mother
- 36 Poetic tribute
- 37 Loan for home-owning seniors
- 41 Republicans, for short
- 42 Military group
- 43 Walked through water
- 44 Part of Great Britain
- 47 Heavy mist
- 48 Ancient

49 Hits

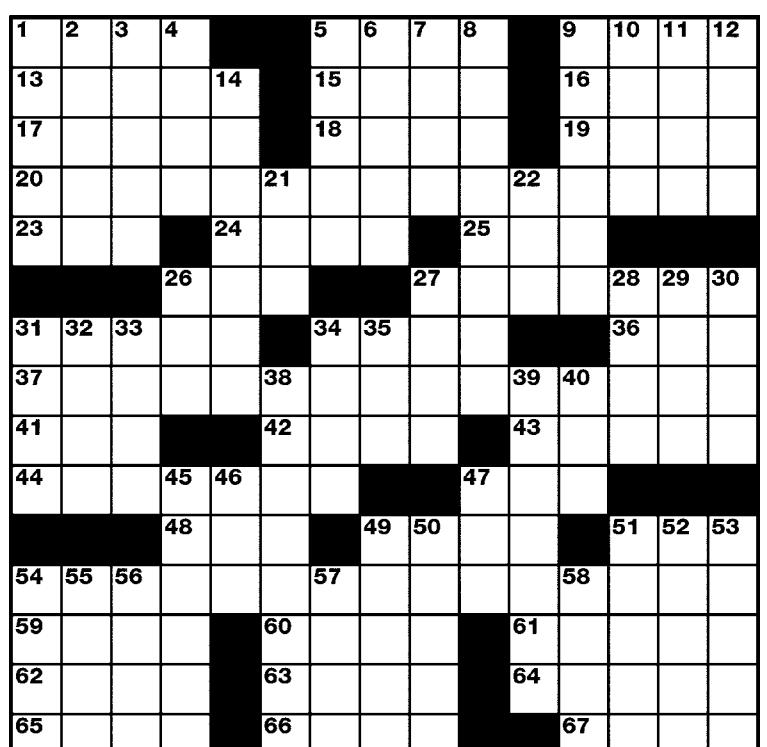
49 Hits the road
 51 Tooth docs' org.
 54 Order-filling intervals
 59 Imitated
 60 Chapters of history
 61 Try for a job
 62 Commotion
 63 Keep for later
 64 Itinerary
 65 Author unknown: Abbr.
 66 Venetian blind strip
 67 Small quarrel

DOWN

1 Cop's ID
 2 Wrong move
 3 Sun-dried brick
 4 __ Scotia, Canada
 5 Heed, as advice
 6 Drop (down), as cash
 7 "Ali __ and the Forty Thieves"
 8 More lively
 9 Daily publications
 10 Bone-dry
 11 Perform a tune
 12 Overfill
 14 Get one's strength back

21 Baby goat

- 21 Baby goat
- 22 Once around the track
- 26 Cube rolled in a
casino
- 27 Easy run
- 28 Frog's relative
- 29 Boundary
- 30 Swamp stalk
- 31 Advise strongly
- 32 Advertising sign gas
- 33 Prime-time family
viewing rating
- 34 Patch up
- 35 French friend
- 38 Woman's summer
frock
- 39 So-so, as a film
review
- 40 Comedian's joke
- 45 Capital of 44 Across
- 46 Pie __ mode
- 47 Gave lunch to
- 49 Tropical jam fruit
- 50 Beginning
- 51 Intensify, informally
- 52 River mouth
- 53 So far



54 "Bye-bye!"

54 Bye bye!
55 "Once __ a time . . ."

56 Overhaul

57 Spoken aloud

57 Spoken aloud
58 Stock-market debuts, for

short



Andrew A. Busse '15 spikes the ball to the other side. MIT Men's Volleyball played Dominican University Tuesday night in a close game, losing 2-3.

CHAARUSHENA DEB—THE TECH

Expo addresses bitcoin trading and regulation

Litecoin creator says bitcoin will trump other currencies

Bitcoin Expo, from Page 1

base, a bitcoin wallet and exchange service.

Lee spoke on the "nature of money" and said he believes cryptocurrency represents money's best form. "I payed for my flight using a currency [Litecoin] I created three and a half years ago," he said. "I think this deserves an 'achievement unlocked.'"

Other Saturday speakers discussed bitcoin regulation, general accessibility, value fluctuation, and trading. "Mastering Bitcoin" author Andreas Antonopoulos discussed bitcoin's public perception in the media and the benefits of the current bitcoin mining system.

"It's not about bitcoin succeeding," Antonopoulos said in response to a question about plans to transition from today's financial system to one based on bitcoin. "It's simply about bitcoin surviving while the entire world economic system collapses in ashes around it."

Gavin Andresen, a developer of the bitcoin protocol and chief scientist at the Bitcoin Foundation, delivered Sunday's opening keynote. He discussed some of the technical changes that bitcoin would have to make in order to handle worldwide demand for transactions.

Other Sunday speakers discussed current and future bitcoin technologies, as well as challenges like scalability, proof of payment, and security. Armory Technologies developer Andy Oftiesh talked about the advantages of a decentralized proof-of-payment system, and bitcoin core developer Peter Todd explained how bitcoin's payment verification structure can be scaled up indefinitely.

Sunday also included student project presentations, including one from Sam Udotong '16. Udotong presented his app, Fireflies, a person-to-person delivery service that uses bitcoin payments. Udotong and his team won the Awesome Award in last year's MIT Bitcoin Competition (BitComp).

The expo wrapped up on Sunday afternoon with remarks from the presidents of the Wellesley and MIT bitcoin clubs.

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Isabella D. DiDio '16 attacks the net during MIT's 12-9 win over Keene State College on Wednesday, March 4.

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MIT develops new Ebola testing method

Members of MIT's Institute for Medical Engineering and Science (IMES) have developed a thin paper strip that can detect the Ebola virus in ten minutes when exposed to a sample of a patient's blood, an improvement over previous methods that took days and required a laboratory setting.

The technology will allow health care workers to test for Ebola quickly in the field. Getting a reading is easy: the paper simply changes color if the patient is infected.

Many news outlets have praised the IMES team's work, product of the efforts of postdocs, instructors, and visiting scientists. An article published in *Forbes* predicted that the newly developed technology, which costs only \$2 per test and requires little training to administer, could be a "game changer" in the West African struggle against Ebola.

The project's lead researchers remarked that the silver nanoparticle-based strip makes an Ebola test as quick as an in-home pregnancy test. Moreover, the strip simultaneously tests for dengue and yellow fever.

Senior author Lee Gehrke said that their work could be applied to future outbreaks. "[W]e're thinking about what's coming next. There will undoubtedly be other viral outbreaks. It might be Sudan virus, it might be another hemorrhagic fever. What we're trying to do is develop the antibodies needed to be ready for the next outbreak."

—William Rodriguez

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Solution to Saturday Stumper

from page 7

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N	A	T	U	R	E	D	E	I	T	Y	H	E	R
F	R	A	G	I	L	E	G	O	S	A	D	O	
I	S	L	E		C	A	S	E	T	U	R	I	N
T	E	N	E	R		R	E	E	N	A	C	T	
	I	N	O	U	T		W	R	A	P	U	P	
G	O	S	E	E	R	I	L	E	Y	O	R	A	
U	S	A	M	A	L	L	A	R	D	V	E	G	
A	C	S	I	B	S	E	N	A	B	A	S	E	
R	A	Q	E	L	S	K	A	T	E	R	E	T	
D	R	U	M	S	E	T		B	E	R	E	T	
S	H	A	W	L	Y	E	P	S		A	L	B	
M	O	T		I	M	P	R	E	C	A	T	I	
E	S	C		S	I	E	R	R	A	L	E	O	
N	T	H		T	O	A	S	T	M	A	S	T	

Solution to About-Face

from page 8

B	E	A	N		A	P	B	S		P	A	S	S
A	R	D	O	R		C	L	A	N		A	R	I
D	R	O	V	E		T	U	B	A		P	I	N
G	O	B	A	C	K	N	A	P	L	E	D	G	E
E	R	E	O	I	N	K		P	A		R		
	D	V	D		T	I							
U	N	T	I	E		M	A	R					
R	E	V	R	S		E	M	O					
G	O	P	U	N		T	R	G					
E	N	G	L	A									
T	U	N	R	A									
A	P	E	D	E									
T	O	D	O	S									
A	N	O	N	S									

Partners from famed startup accelerator Y Combinator lead discussions at MIT

Sam Altman encourages students to start their endeavors early, but cautions against trying to balance school and startups concurrently

By Drew Bent
ASSOCIATE NEWS EDITOR

On Thursday evening, over a hundred students gathered in room 26-100 to learn something that is usually not formally taught in MIT classes: how to run a startup.

Leading the discussion were three partners from Y Combinator, one of Silicon Valley's leading startup accelerators. Several MIT companies, including Dropbox and Stripe, were funded by the accelerator.

"There is no pre-startup like there is pre-med," said Sam Altman, the 29-year-old president of Y Combinator. He encouraged students to

start working on a startup immediately and learn along the way.

For students interested in startups, universities form a great hub of ideas and people, said Altman. "School is the best possible place to meet potential cofounders."

Altman cautioned people, however, from attempting to do both school and startups at the same time. People who try it often "fail miserably at both," he said.

Students were also encouraged to steer clear of large companies. It's easy to always want the next most prestigious title—Andover, MIT, Facebook—said Altman. He argued that small, fast-growing startups offer students more signif-

icant roles and fulfillment in their jobs.

Y Combinator visited MIT as part of an annual East Coast tour in which they recruit students for their summer accelerator program. Almost all the students in the audience said they wanted to apply at some point.

Y Combinator usually invests \$120 thousand in its startups, but Altman revealed during the Q-and-A that they have plans for helping startups requiring more money. "We have some news coming on that," he said.

During the Q-and-A, Altman also said the greatest weakness he finds in MIT students who go

through Y Combinator is their "unwillingness to go out and actually talk to users."

Entrepreneurs need to both write code and talk to users, he said. It's not one or the other.

Students wanted to know which types of startups Y Combinator would fund, asking about everything from nuclear fusion reactors to biotechnology.

According to the partners, any startup is fair game.

One student even posed a non-software project of his that removes ice from airplane wings. Without hesitation, Altman responded, "We've actually funded an ice removal company before."

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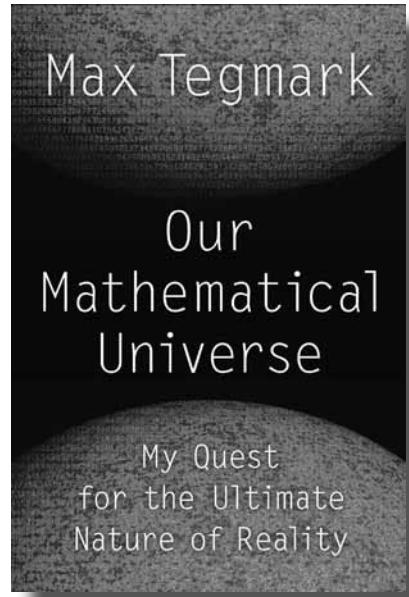
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Max Tegmark

Professor of Physics, MIT

Tuesday, March 17th
5:30 pm
MIT 14E-304
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Solution to Sudoku I

from page 7

9	4	5	8	3	2	1	6	7
8	6	3	7	5	1	2	4	9
7	2	1	9	4	6	3	8	5
5	7	6	2	1	9	8	3	4
4	3	2	5	6	8	9	7	1
1	8	9	4	7	3	5	2	6
3	9	4	6	2	5	7	1	8
6	1	8	3	9	7	4	5	2
2	5	7	1	8	4	6	9	3

Solution to Techdoku I

from page 7

1	4	3	6	5	2
3	6	5	2	1	4
4	1	6	3	2	5
6	3	2	5	4	1
2	5	4	1	6	3
5	2	1	4	3	6

Solution to Sudoku II

from page 7

9	8	4	2	6	7	5	3	1
2	6	1	3	9	5	8	4	7
5	7	3	1	8	4	2	9	6
7	4	6	5	2	8	9	1	3
3	5	8	9	1	6	4	7	2
1	9	2	7	4	3	6	8	5
6	3	9	4	7	2	1	5	8
8	1	5	6	3	9	7	2	4
4	2	7	8	5	1	3	6	9

Solution to Techdoku II

from page 7

4	5	3	6	1	2
6	1	5	2	3	4
2	3	1	4	5	6
1	2	6	3	4	5
3	4	2	5	6	1
5	6	4	1	2	3

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MIT participates in International Development Hackathon; MIT students in half of winning teams

"Code for Good" class held over IAP also connects students with nonprofit organizations

By Angela Leong
STAFF REPORTER

This year, the Tufts Entrepreneur Society and Tufts Empower groups joined MIT to organize the annual International Development Hackathon (IDHack), which took place Feb. 13-14 at Tufts University. For the past two years, MIT's Global Poverty Initiative (GPI) student group has partnered with a Harvard student group to plan the annual IDHack.

This year's IDHack drew around 24 projects and 300 attendees, including sponsors, volunteers, and representatives from organizations. This was an increase from the 20 projects and 200 attendees last year. There were MIT students on four of the eight winning teams.

Unlike traditional hackathons, IDHack provided participants with project proposals from organizations involved in international development, including the World Bank, the Peace Corps, and the

World Food Program, said Jenny Lin '16, the GPI member who planned this event. Representatives from these organizations were also present at the hackathon to work with participants.

Malte B. Ahrens '17, a participant at this year's IDHack, characterized the projects as "hacks with purpose," and the fusion of international development and hackathons as "an interesting mindset [of] let's save the world, fix things, be a hero [...] combined with the traditional energy and enthusiasm of a hackathon, of that all-nighter adventure."

He also expressed concerns about the "standard approach for a lot of international development hackathons to [...] condense all the problems down to problem statements, give them to people who might build a solution from an engineering or technical side, and take that output and try to make something with it... [It] makes you wonder if perhaps this overspecial-

ization... makes you lose sight of the bigger picture."

Looking ahead, Lin said that a goal of IDHack was "for projects that are made in the hackathon to have a life after the hackathon [and] for more of the organizations to take on projects that were implemented." They have reached out to representatives at the World Bank about continuing projects, recognizing that "the big part of them having a life after the hackathon is that we connect the participants with the organizations that they're working for." For instance, the Peace Corps adopted the design of a new job search and application portal created by one of the winning projects last year.

The IDHack organizers were not alone in their mission of connecting students to nonprofits, and encouraging students to use their technical skills to create social impact. This January, 28 students had the opportunity to work with seven local nonprofit organizations in an IAP

class titled "Code for Good," which was sponsored by the MIT Institute of Electrical and Electronics Engineers and Association for Computing Machinery (IEEE/ACM) club.

Anish R. Athalye '17, Benjamin Y. Chan '16, Victoria L. Dean '17, and Erik S. Nguyen '16 created the class after noticing that MIT lacked programs that had a "format where you can work with a non-profit organization for an extended period of time, and really help them by building some infrastructure they need using your [computer science] skills," according to Athalye.

"Not very many people whom I've encountered at MIT spend their free time building projects to help the community per se in a very material way, and this program's goal is to facilitate that," said Chan.

Comparing the Code for Good class to traditional hackathons, Athalye added, "We really wanted to facilitate connections between MIT students and local non-profit organizations, connections that

students might maintain after our class was over."

In designing the class, Chan explained that the team focused on smaller nonprofits that lacked the bandwidth to develop their own applications or technologies, because these were the organizations that could especially benefit from MIT's resources. The team was able to organize multiple visits to the offices of the nonprofits, to allow students a firsthand understanding of their mission and work, through direct interactions with members of the nonprofits.

The Code for Good team has been contacted by individuals interested in starting similar groups at their schools, and has also met with organizers of similar programs at other schools. Dean sees potential to scale the class, which received cross-registrations from Harvard and Wellesley students.

Chan added, "We've helped out seven nonprofits in a month; why can't we do even more?"

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Law enforcement, victims, others testify about week of 2013 Marathon bombing and aftermath

Henniger, first MIT police officer to respond, reported that Sean Collier still had a pulse upon his arrival despite grave wounds; Collier was later pronounced dead at hospital

Tsarnaev Trial, from Page 1

Weinreb asked Harman whether the person he'd seen in the video was in the courtroom and what the person was wearing, Harman faced Tsarnaev and responded, "Yes, he's right there. He has a blue shirt on." Tsarnaev, who had been reclining in his chair until that point, leaned forward, presumably to make his apparel clearer.

Jurors also heard the recording of a 911 call from someone inside the Koch Institute who reported what seemed to be gunshots. The caller said, "it sounds like someone's hitting a trash can really loud," and that a police officer was in the vicinity.

MIT Officer David Sacco, who took the call, attempted to dispatch Collier, who was in charge of the area. After a few calls and texts with no response, enough time passed that Sacco became uncomfortable.

Sergeant Henniger drove past Collier's cruiser at around 10:20 p.m. and did not notice anything unusual. When he reached the station a few minutes later and heard that Collier had been unresponsive, he returned. The scene was the same — "the only exception was that the driver's side door was open."

He observed blood "on [Collier's] weapon" and on his holster. Both he and DiFava demonstrated the holster's three-step security feature. The fact that only one had been undone meant that someone had tried to take the weapon, ar-

gued the prosecution.

Henniger parked and walked over, "and that's when I discovered Officer Collier had been shot," he said. Because he still had a pulse, Henniger radioed for help. "Officer down! Officer down!" and later, "get on it!" are heard in recordings of Henniger's calls.

Another officer who had already been dispatched reached the scene "within 45 seconds" of Henniger, and the two began to perform CPR. Soon, Cambridge Police responders including witness Brendan O'Hearn arrived and provided aid until Collier was taken away in an ambulance.

"His face and his neck were covered in blood; he had some type of a wound to his head; there was blood coming from his mouth," said O'Hearn.

During all of these testimonies, Collier's dad sat listening in the courtroom.

Victims describe smell of burning tissue

Earlier in the week, jurors were presented with testimonies that included graphic descriptions of the explosions at the marathon by victims and first responders.

Jessica Kensky, a nurse at the time of the bombing, testified Monday about the chaotic aftermath of the first blast. She recalled helping her husband, who had just had part of his leg blown off, when a man came up and told her, "Ma'am, you're on fire." Kensky ended up losing both legs due to her own injuries.

Danling Zhou, a fellow Chinese Boston University student and friend of Lingzi Lu who died in the bombings, described the carnage caused by the second explosion where the pair stood in front of The Forum restaurant on Boylston Street. After she awoke on the sidewalk, she said she knew that Lu was alive because she was yelling.

James Bath, a general practitioner who was walking down Newbury Street when he heard what sounded like a cannon, described noticing an "unmistakable smell of burning tissue and blood."

"People had dropped like puzzle pieces" on the sidewalk, he said. He described tending to Lu, who he said had lost too much blood from her injuries to be saved.

Jurors also heard the recording of a 911 call from someone inside the Koch Institute who reported what seemed to be gunshots.

Surveillance video and tweets

The prosecution presented a compilation of security camera video tracing the Tsarnaev brothers as they strode up Boylston street toward the finish line in the minutes leading up to the blast. Dzhokar

stopped in front of The Forum, where he would eventually put down his backpack, while Tamerlan continued on.

Dzhokar appears to talk on his cell phone in the security footage of the restaurant's patio. He walks in the direction away from the finish line while most people in the frame look left toward the first explosion. Seconds later, a bright flash of white consumes the frame.

A later video from a different camera shows him running with other spectators down Boylston away from the finish line.

The defense remained mostly quiet throughout the week, rarely cross-examining the prosecution's witnesses. But in one of the notable exceptions, lead defender Miriam Conrad grilled the FBI agent who compiled the video sequence about the timestamps on the footage, apparently trying to question whether the call depicted in the video corresponded to one listed in phone records from Dzhokar to Tamerlan, as the agent suggested, or one minutes later from Tamerlan to Dzhokar.

The prosecution also presented security footage depicting Dzhokar Tsarnaev's activities after the bombings, showing him buying milk at a Whole Foods shortly after the bombings and working out the next day at a gym at the University of Massachusetts Dartmouth where he was a student.

The jury also saw dozens of posts by two of Tsarnaev's Twitter accounts. One, @j_tsar, contained

Tweets ranging from normal college social media fare to the more ominous. "Never underestimate the rebel with a cause," he posted about a month before the bombing.

The posts by his other account, @Al_FirdausiA, included "I shall die young" in Russian and an invitation to watch videos by militant Anwar Al-Awlaki amid general comments about Islam.

Tsarnaev's manifesto

On Tuesday, jurors got a glimpse of Tsarnaev's so-called "manifesto" that he scribbled on the boat in a Watertown backyard where he hid before being captured. The prosecution has presented his writings as a confession for the crimes.

"The U.S. Government is killing our innocent civilians," the writings included. "I can't stand to see such evil go unpunished." The words were written in pencil and interspersed by blood stains and holes from gunshots that came from the shootout leading up to Tsarnaev's arrest.

The question now remains whether or not jurors will be able to see the entire boat firsthand. The prosecution wants to bring in only the panels with writings on them to the courthouse, while the defense has asked to transport the entire boat to show the writings "in context."

The court session ended early on Tuesday as Judge O'Toole took a visit to the boat to decide for himself. He has yet to rule on the request.

Falun Gong Introduction Seminar

Room 56-169

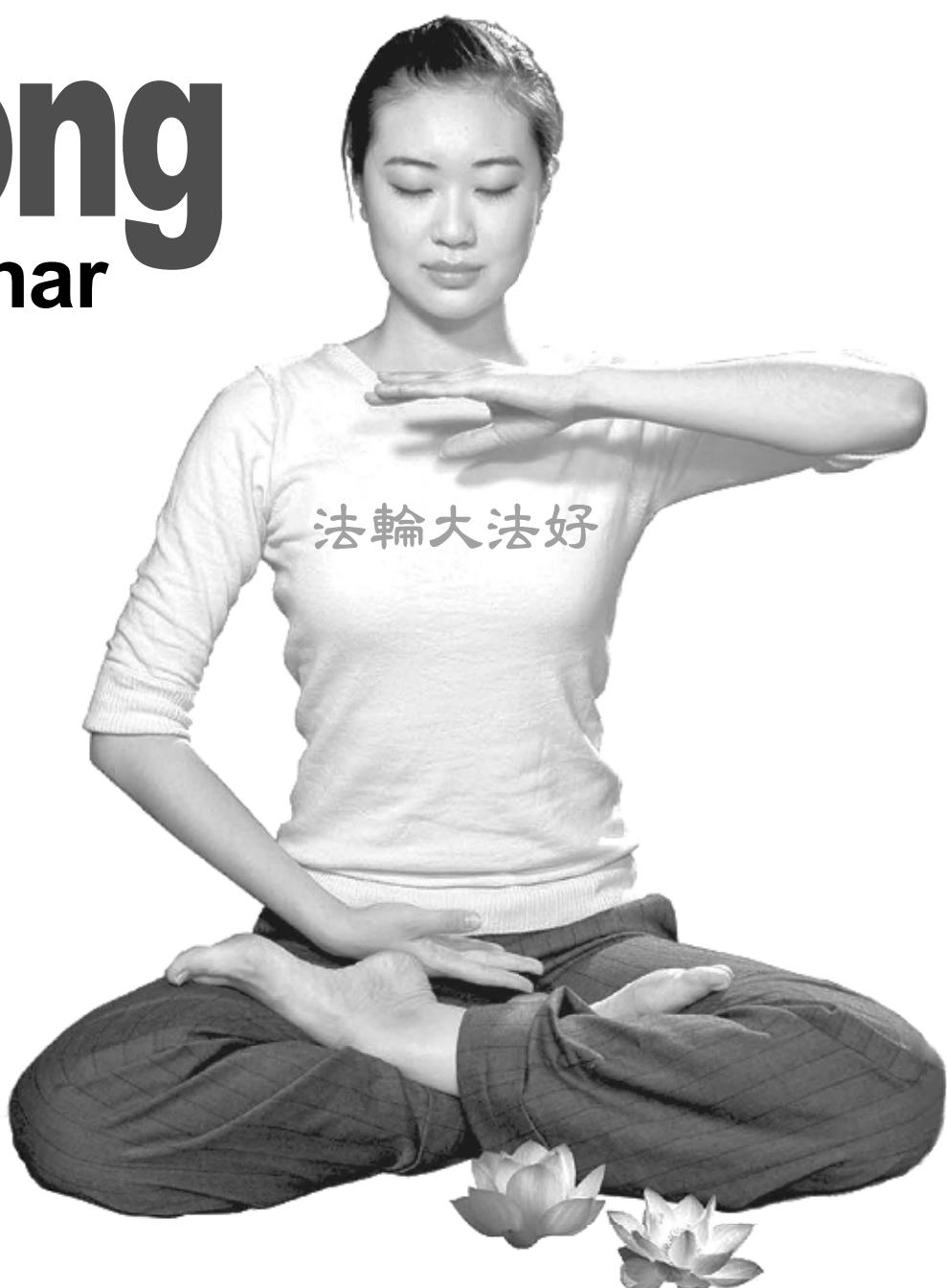
Monday, March 16

7:30-8:30pm Introduction
8:30-9:00pm Free teaching of
 exercises and meditation

Speaker: John Jaw, Ph.D. '75

President of Falun Dafa Association
of New England

An introductory class to Falun Gong, with a brief history of its development in China. Experience the simple practice of exercise and meditation that has drawn over 100 million in China and around the world. A powerful practice that rejuvenates health and vitality, and cultivates life through the principles of **Truthfulness, Compassion, and Tolerance**.



The MIT Figure Skating Club's Annual

FIGURE SKATING EXHIBITION

**Ice Arena, Johnson Athletics
Center**

**Saturday, March 14
6pm**

Free Admission

**Ice Dancing • Freestyle • Group Numbers
Pairs • Theatre On Ice**

****This event is hosted by the MIT Figure Skating club and is sanctioned by the
United States Figure Skating Association****

<http://web.mit.edu/skatingclub/www/Home.html>

Photo taken by Nick Wiltsie '10



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students are encouraged to apply.

**CALL FOR SUBMISSIONS:
SCHNITZER PRIZE IN THE VISUAL ARTS**

Submission Deadline
Monday, April 13, 2015

Sabrina Drammis leads MIT to its best finish in 12 years

Drammis is the seventh player to score 1000 points

By Souparno Ghosh
SPORTS EDITOR

Starting this month, *The Tech* is launching a new "Player of the Month" feature profiling one of MIT's premier athletes from across varsity and club teams. Kicking off the series is women's basketball sensation, Sabrina Drammis '16.

This season, Sabrina Drammis became just the seventh player in the history of the program to surpass 1000 points. En route to being named to the Academic All-America First Team, she played in all five positions this season and led the Engineers to a sixth place finish in the New England Women's and Men's Athletic Conference (NEWMAC). This was MIT's best season in over a decade.

Described by her head coach as "a leader and one of the hardest working student-athletes I have ever coached," Sabrina has improved leaps and bounds over the last three years and emerged as one of the best players in a fiercely competitive league. We caught up with her just days after she was named to the Academic All-America First Team. She appeared remarkably humble and already extremely motivated for the next season.

The Tech: Congratulations on an amazing season and on being named to the Academic All-America Women's Basketball first team! What are your thoughts looking back at the season?

Sabrina Drammis: Thanks. I feel honored to have gotten that

award. I couldn't have done it without my team. Everyone works really hard and we did a lot of good things this season. Unfortunately we fell short of our goal of winning the NEWMAC championship. But now we're focused on the next season and working hard to get it done. I want to see it happen before I leave.

TT: Let's go back a few years — when did you know you wanted to play competitively?

SD: I used to play tennis very competitively but got convinced otherwise by my high school basketball coach. I was playing tennis at Smith Stearns Tennis Academy and training everyday. I was at a new school and wanted to try different things, and the varsity coach finally convinced me to stop playing tennis and moved me up to the varsity basketball team.

I rode the bench that season, but I got to see a lot of good players play. That's when I realized this was the sport I wanted to pursue. I really enjoyed it.

TT: You were a high school state champion in tennis and even decided to split time between tennis and basketball in your freshman year. What tilted it in favor of basketball moving forward?

SD: I was losing some interest in tennis. I was getting burnt out as I was playing a lot. My varsity coach convinced me to shift and I didn't regret it. I enjoyed playing tennis at a less competitive level, like with my high school team, as opposed to playing USTA tournaments.

TT: Do you miss playing

tennis?

SD: I play when I can recreationally. Luckily, last summer where I worked at Second Spectrum, we played as an office once a week. I enjoyed that a lot.

TT: You had a dream final season at the Hilton Head High School. You were quoted afterwards saying, "I really couldn't ask for any more. It was a great year." Could you take us through that year, in particular what you achieved and what it meant to you?

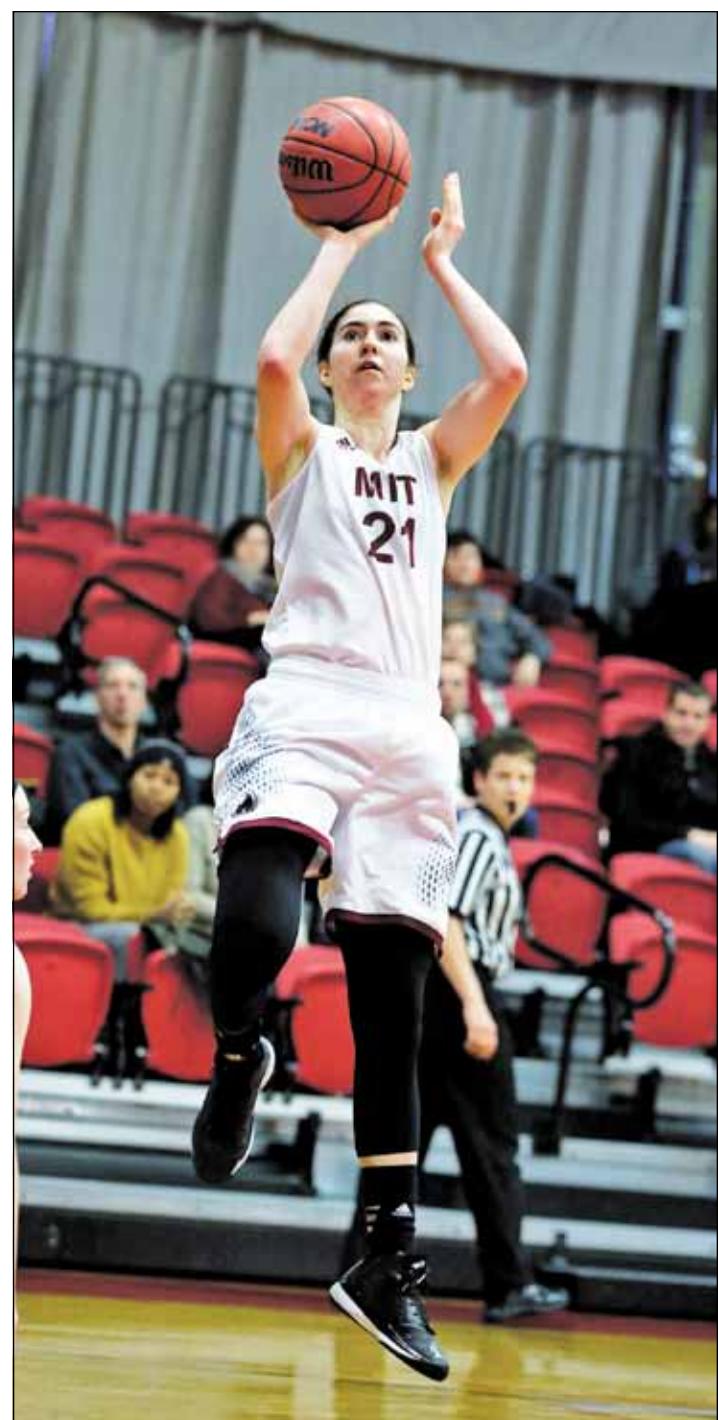
SD: Wow! That was a long time ago! We won our region that year. After our freshman year, people thought our team wouldn't be as good because we lost a lot of seniors. But my good friends and I worked really hard. In my sophomore year, we weren't that successful, but both in my junior and senior years we won the regional.

I enjoyed being part of the team. I liked the coach and improved a lot as a player.

TT: You must have had plenty of offers at your disposal. What prompted you to come to MIT?

SD: Well, I knew I wanted to play basketball and I wanted to do computer science. It really came down to a few options, and then I visited MIT twice. I came on a recruiting trip during the fall and that's when I spent a ton of time with the team and realized how awesome the team was. They were really cool people. Then I came back for CPW and realized this place is really unique. People are

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COURTESY OF DAVID SILVERMAN

Sabrina M. Drammis '16 in action.

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